MB Series

Powered Loudspeaker Systems
User Manual

V.3.3

MB Series Powered Loudspeaker - Packing list

- ☑ 01- MB Series Powered Loudspeaker. The specific model is written on Connectors Panel
- ☑ 01- Neutrik PowerCon mains connector and wiring guide (at the end of the User Manual)
- ☑ 01- User Manual (in the same box or in an attached envelope)
- ☑ 01- Warranty statement (included in the User Manual)

After unpacking MB Series Loudspeaker, please inspect for any physical damage and retain all packing materials for use, should ever the unit need returning. In the event that damage has occurred, please notify your dealer immediately, so that a claim to cover the damages can be initiated.

MB Series Loudspeakers Description

MB Series include Full Range Loudspeakers (MB 8.1, MB 12.1, MB 15.2), Stage Monitors (MB 12.2W, MB MAV-2W) and SubWoofers (MB 12.0, MB 18.0). All systems combine advanced-technology amplifiers, close coupled signal processing, and state-of-the-art drivers housed in rugged, roadworthy loudspeaker enclosures. Acoustic and electronic structure of MB Loudspeakers is designed in order to optimize coverage pattern control vs. frequency and to perform smooth frequency and phase response over the widest possible range. As a result MB Series Loudspeakers are particularly suitable for high demanding applications in terms of details definition and sonic quality, arrayability and wide dynamics program material.

Important Warnings

- ➤Before you use MB Series products, read User Manual carefully and observe all the safety precautions. It is important for your protection and helps to avoid equipment failures. Keep User Manual in a safe place so that it is available for future reference. Please give the Manual to the new owner in case you sell this unit. Copies are available at your dealer.
- ➤This unit needs to be installed, connected and used only according to the instructions described in this Manual. The manufacturer declines all responsibilities in case of wrong or unforseen installation as well as for wrong usage.
- ➤This device is studied for professional usage. All its functions need to be operated by personnel with technical knowledge or sufficient experience to enable them to work properly. Particularly it is necessary to evaluate and avoid risks due to electricity, mechanical stability and suspended loads.

Important Safety Instructions and Precautions

- ➤ Disconnect MB Loudspeaker from mains supply before making or changing connections, when left unused for a long period of time and during lightning storms.
- ➤ Lay all cables to and from the unit so that they cannot be crushed by vehicles or other equipment and that no one can step on them.
- ➤ Mains voltage and frequency must be the same as printed in this manual (on page 11) and on the rear panel of the unit. Only use proper mains power cord and connectors (Neutrik PowerCon). The receptacle must be connected to a fuse or circuit breaker.
- ➤ MB Series Loudspeakers must be grounded. The unit must not be operated unless the power cord "Ground" wire is properly terminated. It is important as well to make sure that all of equipments in the reinforcement system are properly grounded. Removing any protective ground connection or cable shield connection is strongly not recommended. This is important for personal safety, as well as for proper control over the system grounding.
- ➤ Do not remove covers, do not disassemble electronic modules. No user serviceable parts inside, refer servicing to qualified service personnel.
- ➤ The unit must not be operated and service by qualified personnel should be provided when:
  -Mains power cord is frayed or broken.

-Objects or liquid have fallen into the unit, or the unit has been exposed to rain.
-The unit was dropped or the cabinet is damaged.
-The unit does not appear to operate normally.

- Keep dust, moisture, water or other liquids away from the unit. Ensure that it is protected from heat and vibrations during both operation and storage.
- MB Loudspeakers are convection-cooled systems. Heatsink may become hot while the unit is operating: use caution when approaching it.
- In order to ensure adequate heat disposal the heatsink on the rear panel of the loudspeaker must not be covered, not be under direct sunlight or spotlights, and adequate space for air ventilation must be provided.
- This product may be capable of producing sound levels which could cause permanent hearing loss. Do not operate at high volume levels or at a level that is uncomfortable. The sound engineer or the responsible for the audio system should organize proper protection for himself and for the audience, in order to prevent exposure to potentially dangerous SPL levels. If you experience any discomfort or ringing in the ears, or suspect an hearing loss, you should consult an audiologist.
- Loudspeakers produce a static magnetic field even if they are not connected or are not in use. Take care not to place any object close to loudspeakers, which may be damaged by magnetic fields.
- To meet the EMC requirements and minimize induced noise, use only shielded balanced cables with properly connected plugs for all signal and shield terminals.
- Note that restrictions may be applied by local authorities for temporary or fix installations in relation to harmonics and voltage fluctuations (flicker), and to specific EMC emission-immunity issues.
- Note that, as any equipment including signal processing, acoustical interference and malfunctions may occur if the unit is operated in the immediate vicinity of a strong source of electromagnetic radiation (e.g. power amplifiers, light dimmers, RF transmitters, wireless microphones, mobile phones, etc.). Damage to the unit is unlikely, but cannot be excluded. For the same reason, please ensure to keep signal cables as far as possible from mains cables.

Mechanical Installation

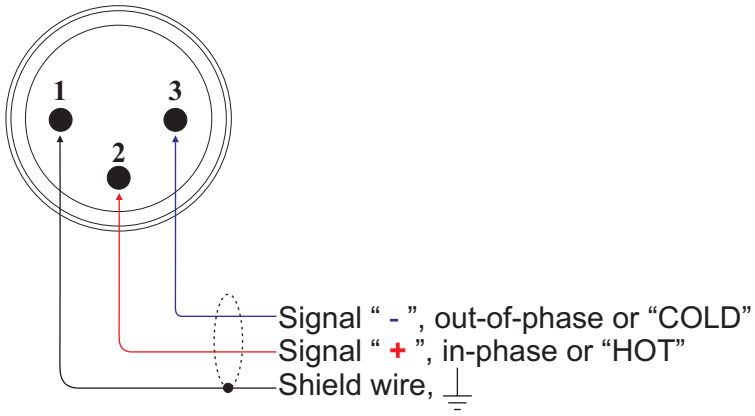
- When stacking loudspeakers or setting up loudspeaker stands, make sure they are standing on a firm and flat surface. Especially if you place loudspeakers on top of one another, unwanted movements may occur due to sound vibrations, wind, etc. Use straps to secure them against dangerous movements. Improper stacking could result in loudspeakers falling and causing injury.
- MB 12.1, MB12.2W and MB 8.1 (this one provided with U bracket adaptor) can be mounted on loudspeaker stand (35 mm diameter). Please refer to stand documentation for detailed instructions. Improper installation or usage could result in the loudspeaker falling and causing injury.
- MB 15.2, MB MAV-2W, MB 12.0 and MB 18.0 are not intended for use on loudspeaker stand.
- MB 12.0 and MB 18.0, using a proper stand, can support MB 8.1, MB 12.1 or MB12.2W.
- Both models MB 12.1 and MB 15.2 can be flown, but never hang more than 3 loudspeakers under one another. Specific MB suspension hardware must be used. Please contact your dealer and refer to MB Suspension Hardware Manual for important operative and safety instructions.
- MB 8.1 can be flown using the adequate U bracket adaptor and other specific hardware. Never link to each-other more cabinets in a vertical line for safety reasons. Please contact your dealer and refer to MB Suspension Hardware Manual for important operative and safety instructions.
- For all suitable models, when hanging the loudspeaker, at least 2 hanging points must be used. An additional and indipendent safety point for each loudspeaker is strongly recommended.
- MB MAV-2W, MB12.0 and MB18.0 are only intended for use on the floor.
- Whether MB systems are suspended or not, adequate grade (at least 8.8) M10 screws must be completely screwed into all of the threded holes, since these are parts of internal bracing structure of the cabinet. This is also important to assure the proper acoustical performance of the systems.
- The handles on loudspeakers are for transportation. They are not designed for suspension or hanging.

Furthermore, as a basic safety notice, consider that this manual does not explain how to suspend loudspeakers. To properly suspend any loudspeaker, a knowledge of structural engineering and

structural rigging is required. The improper installation of flying loudspeakers may result in bodily injury or death. Always consult a licensed engineer to verify design and construction of any suspended system, and to determine if rigging hardware, loudspeakers and their internal bracing parts are suitable for your particular use. The owner and/or the user have responsibility to adhere to local regulations, to evaluate reliability of any rigging system they use for their specific application and to determine suitability of this product for any particular suspended usage. The manufacturer accepts no responsibility for any accident, damage or failure of any rigged and suspended system.
In addition, please follow these safety steps:

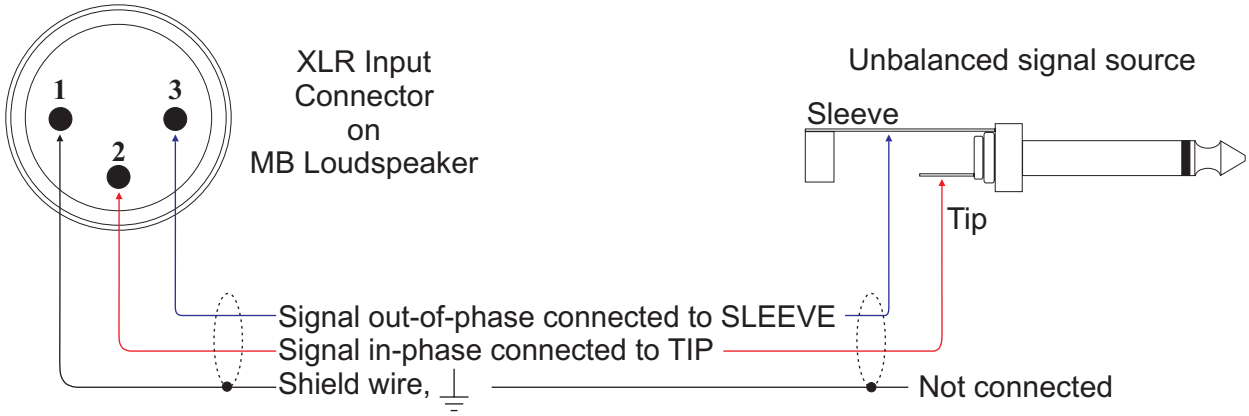
- Use only hardware specifically designed for rigging applications.
- Consider pulling-angle factor at hanging points when planning rigging system.
- Always use an independent safety suspension system as a backup for each suspended loudspeaker.
- Do not use straps for lifting purposes.
- Do not lift any loudspeaker system or other equipment over the head of people.
- When assembling flying hardware it is advisable to use thread-locking compound to eyebolts and other bolts in order to avoid any possibility of loosening.
- It is important to inspect both rigging hardware and rigging parts on loudspeakers, and replace worn or damaged components immediately.

Wiring scheme for balanced Input/Parallel-Out XLR Audio Connectors (male / female)

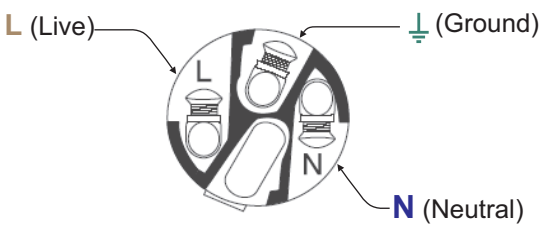


Example wiring scheme when only unbalanced signal source is available

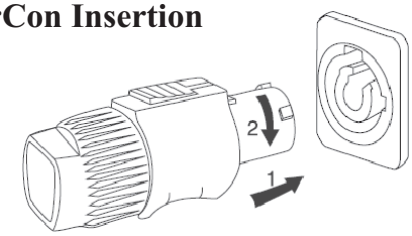
(different wiring scheme could be suggested depending on the specific situation)



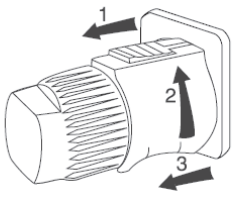
Wiring scheme for Neutrik PowerCon (internal side view)



PowerCon Insertion



Removal



Attached to this manual is part of manufacturer documentation for Neutrik PowerCon, where you can find mechanical and electrical details how to assemble this connector.

Connectors Panel (Connections and Controls)

The connectors are on the rear or side panel of the Loudspeakers. The layout of connectors panel is slightly different depending on MB Loudspeaker's model. Please refer to specific layout for model(s) you are using, which you can find on page 7.

[1] Mains AC Input Supply Connector. MB Series Loudspeakers use a PowerCon 3-pole AC mains connector for their power inlet (see Figure on page 5). It is important to determine and use adequate wire gauge for mains cable considering the voltage drop that occurs across the cable's resistance. This is a function of the gauge and the length of the conductors, the current drawn by the load and the starting AC mains voltage.

Internal fuse is provided on mains circuit, which will only blow in the event of major fault condition. In case you suspect it is blown, refer to your dealer for service arrangement. Do not try to operate the unit.

Grounding-Shielding circuit is organized in the way that signal ground (XRL Pin1) and mains ground are permanently connected together at one single point (internally). This reduces the risk of hum due to ground loops when balanced audio equipments are properly connected in a chain.

[2] Mains AC Output Supply Connector. This connector provides output for mains line to link other loudspeakers. The number of loudspeakers linked to each other must not exceed the main line current capcity, and cable used should have adequate cross section. Anyway the total current of the chain, including all systems connected, must not exceed the current rate of a single PowerCon (20A maximum).

[3] Power LED (blue) lights when MB Loudspeaker is connected to mains supply and internal DC is available.

[4] XLR Input Connectors accept input audio signal. Nominal input level is +4dBu. 12KΩ impedance electronically balanced. See Figure on page 5 for wiring scheme.

SubWoofer models MB 12.0 and MB 18.0 are provided with stereo input (Left and Right). Signals are internally mixed to mono. This is usefull to setup systems consisting of stereo Full Range section and mono SubWoofer section.
Note that Parallel Out (Left and Right) provides anyway Full Range stereo signal to drive other systems.

When only one input is used on SubWoofer (e.g. Left input), then connecting Parallel Out Left to Right Input drives +6dB signal into the SubWoofer. In general it is always recommended to drive both Left and Right inputs on MB SubWoofers with identical signals, instead of driving one single input with +6dB higher signal.

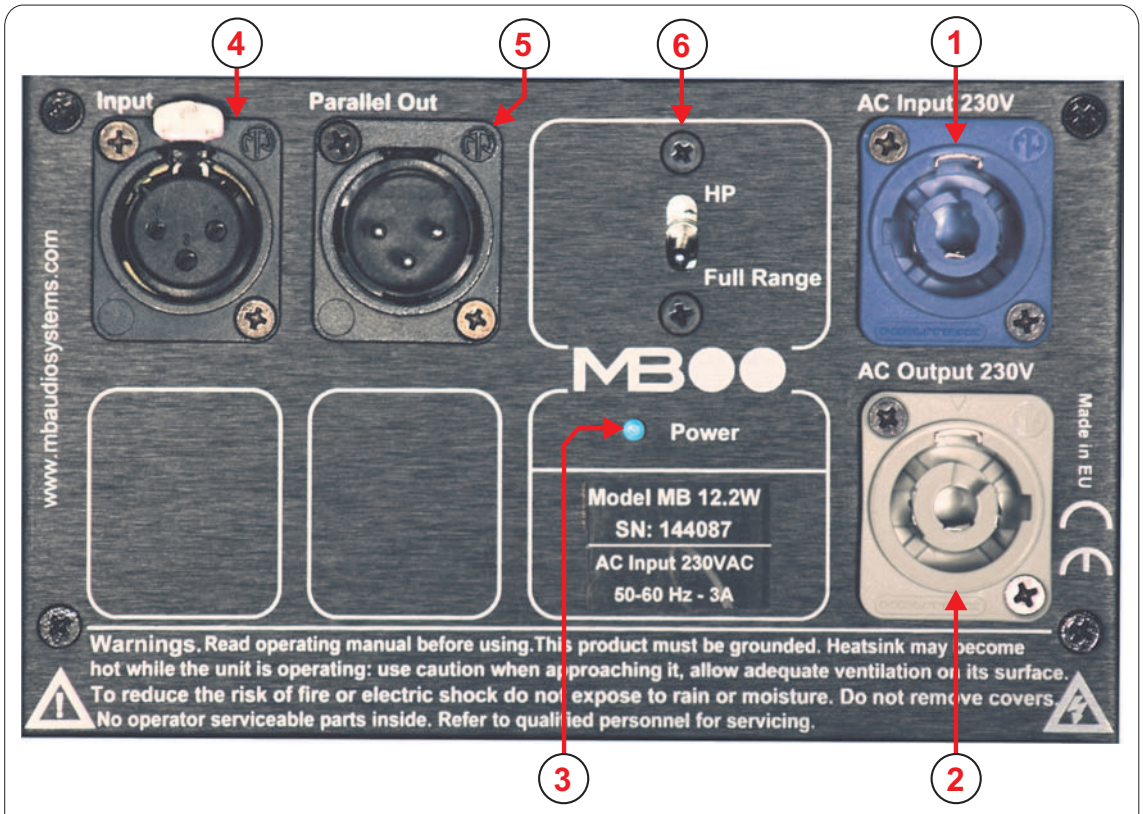
[5] XLR Parallel Out Connectors are intended for the purpose of daisy-chaining multiple powered Loudspeakers together on a common signal feed. Input and Parallel Out connectors are hard-wired in parallel. Take care to check that the signal source is capable of driving the total impedance resulting when paralleling the group of powered loudspeakers. As a practical rule use the following formula for MB Loudspeakers:

$$\text{Maximum number of parallel Powered MB Loudspeakers} = \frac{12.000\ [\Omega]}{(\text{Source Impedance}\ [\Omega] \times 10)}$$

[6] Operation Mode Switch

Models MB 8.1, MB 12.1, MB 15.2, MB 12.2W, MB MAV-2W

This switch configures internal processor to drive the system in **Full-Range** mode or **Crossover** mode (**HP**).
In Full Range mode internal processor provides extended low frequency responce within the widest


4
5
6
1
Input
Parallel Out
HP
Full Range
AC Input 230V
www.mbaudiosystems.com
AC Output 230V
Power
Made in EU
Model MB 12.2W
SN: 144087
AC Input 230VAC
50-60 Hz - 3A
Warnings. Read operating manual before using. This product must be grounded. Heatsink may become hot while the unit is operating: use caution when approaching it, allow adequate ventilation on its surface. To reduce the risk of fire or electric shock do not expose to rain or moisture. Do not remove covers. No operator serviceable parts inside. Refer to qualified personnel for servicing.
3
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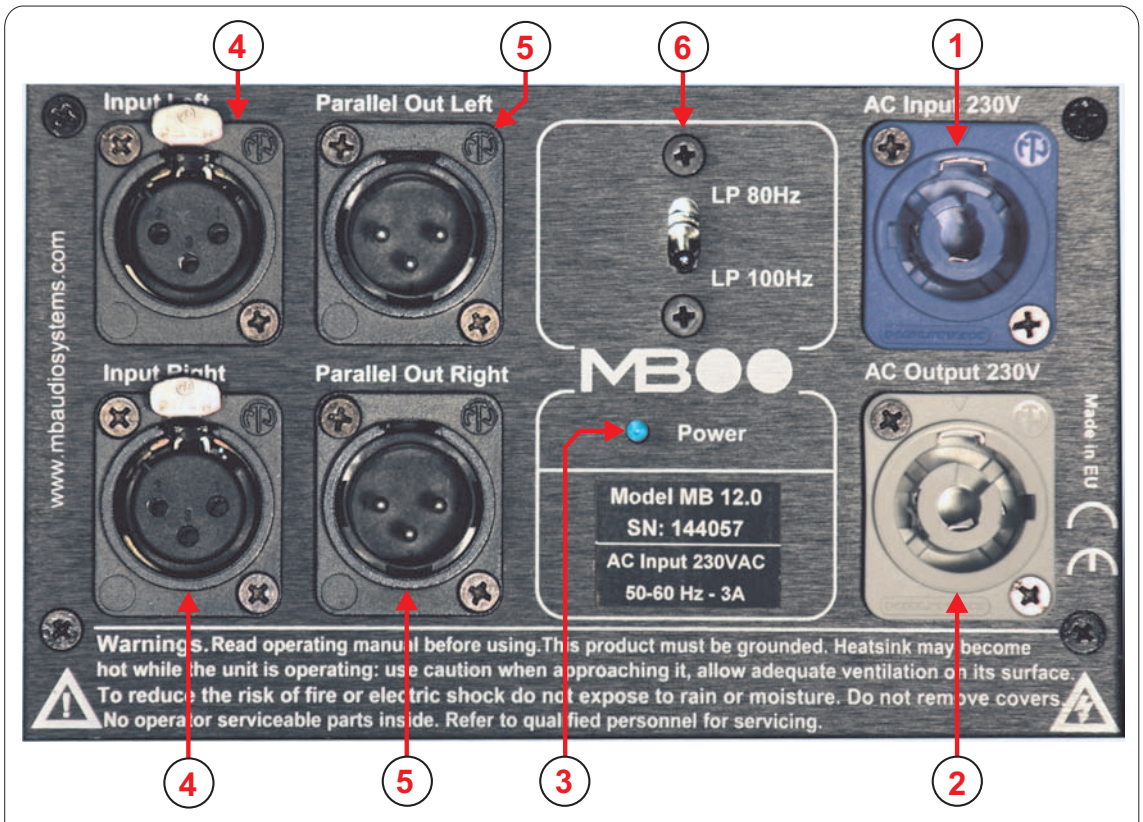
MB 8.1, MB 12.1, MB 15.2, MB 12.2W, MB MAV-2W Connectors Panel (example for MB 12.2W)


4
5
6
1
Parallel Out Left
LP 80Hz
LP 100Hz
AC Output 230V
Input Right
Parallel Out Right
www.mbaudiosystems.com
Power
Made in EU
Model MB 12.0
SN: 144057
AC Input 230VAC
50-60 Hz - 3A
Warnings. Read operating manual before using. This product must be grounded. Heatsink may become hot while the unit is operating: use caution when approaching it, allow adequate ventilation on its surface. To reduce the risk of fire or electric shock do not expose to rain or moisture. Do not remove covers. No operator serviceable parts inside. Refer to qualified personnel for servicing.
4
5
3
2

MB 18.0, MB 12.0 Connectors Panel (example for MB 12.0)

Safe dynamic range.
In HP mode internal processor provides HP crossover function based on Linkwitz-Riley 4th-order acoustical responce. This perfectly matches the proper MB SubWoofer model.

Model MB 18.0 and MB 12.0

This switch configures internal processor to drive SubWoofer in **Crossover** mode based on Linkwitz-Riley 4th-order acoustical responce at **100Hz** or **80Hz**.
The choice of Crossover Frequency depends on which MB Full Range model is used in combination with MB 18.0 or MB 12.

The following table provides a general guideline how to combine Full Range and Subwoofer models:
MB 8.1 (HP mode) - MB12.0 (100Hz mode): crossover frequency 100Hz.
MB 12.1 (HP mode) - MB 18.0 (100Hz mode): crossover frequency 100Hz.
MB 15.2 (HP mode) - MB 18.0 (80Hz mode): crossover frequency 80Hz.

Operation Mode Switch (General Consideration). Full Range mode should be chosen when Loudspeakers (Full Range section) are used without SubWoofer. However HP mode may be also useful as System-LowCut in specific situations. This results in acoustical responce shaped as Linkwitz-Riley 4th-order HP filter tunded at stated frequency (100Hz or 80Hz, depending on the model). On the other side Full Range mode could be usefully operated by experienced engineers even when SubWoofer is used, especially on MB 15.2, after phase relations amoung the different sources has been properly analysed and tuned.

Operating Sequence - Follow these steps:

- Make sure that all mains cables are disconnected in the reinforcement system.
- Connect all audio cables respecting wiring schemes provided for operated equipment.
- Provide proper configuration for Operation Mode Switches on all of Loudspeakers.
- Make sure that no audio signal (or very low level) is at Loudspeakers input, to avoid transients or unexpected loud sound.
- Switch on first other units (mixer, outboard effects, etc), then connect MB Loudspeakers to mains, otherwise cracking noise could be expected which could potentially damage Loudspeakers.
- After 5 seconds mute, the system is ready to work
- Switch off sequence has to be reversed: first MB Loudspekaer, then other units.

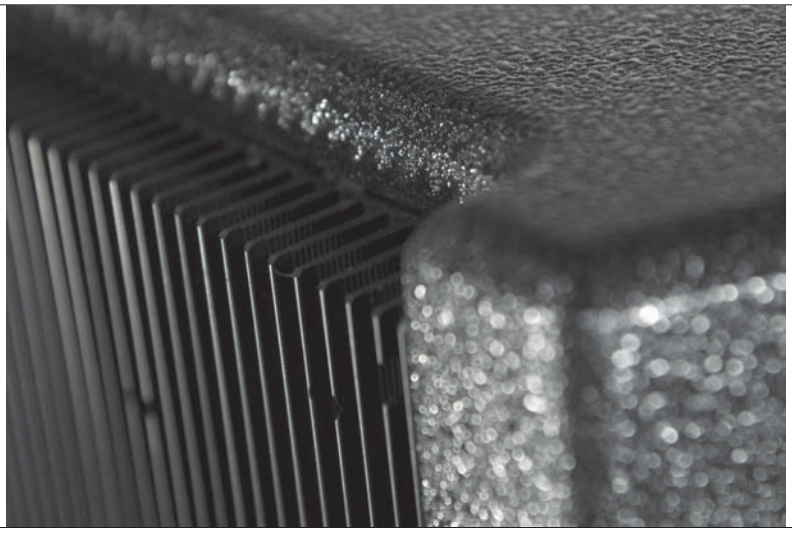
Important Operating Notes

- For most applications driving MB SubWoofers and MB Loudspeakers (Full Range section) with the same signal provides adequate balance. Driving SubWoofers with two input signals (Left and Right inputs) increases the level (up to +6dB when signals are identical and in-phase). When a specific different balance is needed, then an external level control is advised (e.g. Mono or Matrix output from FOH EQ or Mixing Consolle).
- Each transducer inside MB Loudspeakers is provided with independent time-shaped limiter system that reduces the risk of possible failures due to driver over-excursion and voice coil over-temperature. This is achieved at the cost of minimum audible dynamics compression.
  However a continuously increasing input level has to be avoided, as considerable and audible loss of dynamics may be expected. In this situation although protected by the limiter, the components experience a considerable loading (due to reduced crest factor of compressed audio program) which can significantly shorten their lifespan.
  The sound engineer should recognize, when input level is in the mentioned range or higher, that the audio program from the loudspeaker is highly compressed and turn down the level of input signal. In this situation additional loudspeaker systems should be used, to provide the desired SPL.

- MB Loudspeakers are designed for audio applications. Full range audio program signal is expected to be used as input. Although time-shaped limiter systems are implemented, using high energy band-limited signal, or exteme equalization (boost) on a full range signal may damage this equipment.
- Overload and clipping must be avoided inside all of the equipments in the audio signal chain, since there is no way to prevent distorted sound or possible damage to the loudspeakers when audio signal at their input is already distorted.
- Digital converting/processing time inside MB Loudspeakers results in 1,5ms (milliseconds) delay for all of MB models, referred to input signal. Use of different loudspeaker systems (provided with analogue, digital, or no processing) in combination with MB Loudspeakers should be carefully evaluated. Delay difference should be compensated, if needed, to avoid destructive acoustical interference.
- Thermal protection operates when heatsink (internal) temperature reaches 85°C. As a consequence the amplifiers will shutdown, and automatically restore when the temperature decreases below mentioned threshold.
- MB Loudspeakers are designed to be used within ambient temperature range 0°C - 45°C. Higher or lower temperatures could cause the system to shutdown or result in components failure. Take care to avoid direct intense sunlight on heatsink. This could raise the temperature of heatsink and force the amplifiers to protection-mode to avoid permanent damage.
- If MB Loudspeakers are used in horizontal position, cooling efficiency of the heatsink is reduced. In this situation take care to evaluate ambient temperature and SPL level you need, to predict if the margin is still reasonable before thermal protection will shutdown the amplifiers.
- In case one of the protection systems is engaged and doesn't automatically restore when the cause is removed, you can restore it manually disconnecting mains and reconnecting after 15 seconds.
- In order to avoid possible dangerous short circuits when touching other equipments or cables, please consider that connectors panel and heatsink are at Ground level.

Visit the web site www.mbaudiosystems.com for more information about MB Audiosystems arrays configuration, performance and fine tuning. Refer to MB Suspension Hardware Manual for important information about suspension hardware setup, and follow all safety recommendations.
Please do not hesitate to contact your dealer if you have any doubt or question about MB Series installation, specs or operations.

The information presented in this manual is, to the best of our knowledge, correct. The manufacturer will however not be held responsible for the consequences of any error or omission. In keeping with a policy of continued improvement, the manufacturer reserves the right to alter specifications without further notice.
Rights for names and trade-marks quoted in this manual belong to respective owners.



ce statement of conformity

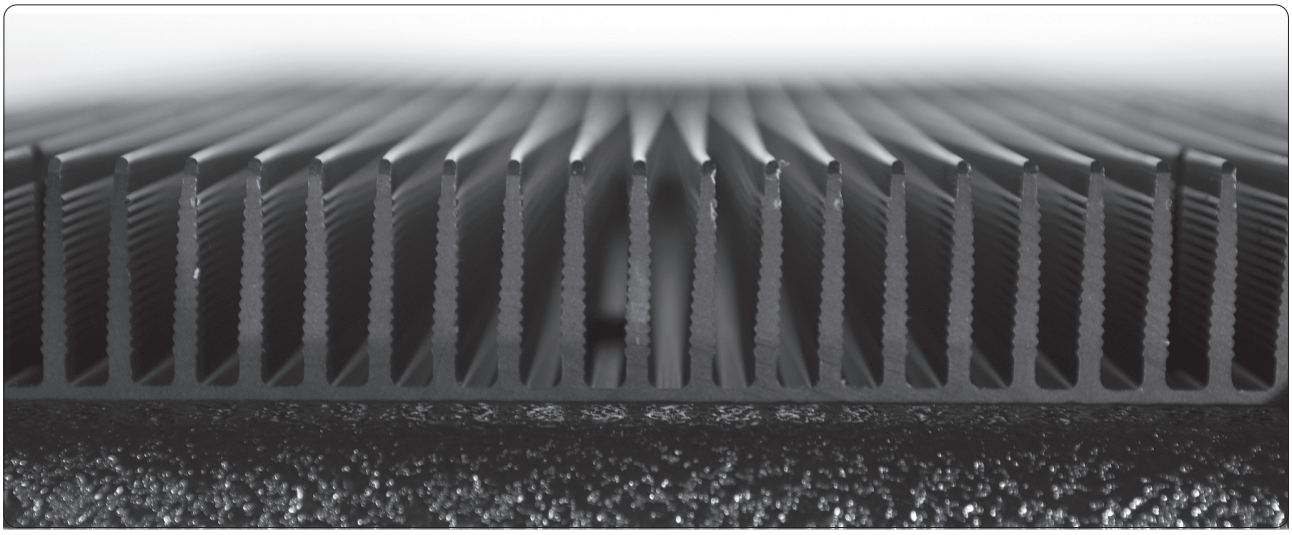
The manufacturer HOF Sales B.V. - Felland Noord, 3 - 9753 TB - Haren - The Netherlands, declares that the products MB8.1, MB12.1, MB15.2, MB12.0, MB18.0 , MB 12.2W, MB MAV-2W, to which this statement refers, conforms to the following standards or other type of regulatory documents: EN 60065, EN 55103-1, EN 55103-2 with reference to EU directives 73/23 and 89/336.
Haren, 01/03/2009

Responsible for HOF Sales B.V.
Auke Meijer

The form of this statement conforms to EN 45014 specifications.
ce marking is on the rear panel of the product, in the area close to power supply connector.

Warranty Statement

Manufacturer: HOF Sales B.V. - Felland Noord, 3 - 9753 TB - Haren - The Netherlands.
Products have a warranty period of 36 months, starting from delivery date. Electronic components (analogue modules, semiconductors, capacitors, etc.), digital modules and acoustical transducers are excluded from this warranty; general manufacturer conditions and warranty policy apply for these components. Warranty only applies when the final payment has been received by the dealer or the manufacturer. Warranty will be valid only if this statement, together with the original invoice, will be shown to an authorized service centre or to the manufacturer. If the product does fail during the warranty period, which can be related to components or mounting defects to be decided by the authorized service centre or manufacturer, all costs regarding labour and replacement parts will be at manufacturer expense. Warranty does not apply if the serial number (S.N.) is deleted or modified on the product. Warranty is not valid if the product has been damaged by negligence or incompetence of the customer or user, for accident, or if all indications, use-limits and safety warnings explaned in the user manual (provided with the product) have not been respected. Warranty does not apply if any unauthorized modification has been made to the product, without prior written notice from the manufacturer. The manufacturer is not held responsible for any inconvenience caused during the time the product cannot be used. No refund will be made for cost incurred by repairs and/or replacement parts made by non authorized service centres. In all cases the customer will send the product at own risk and costs to service centre or manufacturer. Only warranty stated by the manufacturer apply in all circumstances.



MB AUDIOSYSTEMS

Product Range

Performance & Physical Data	MB 8.1	MB 12.1	MB 15.2	MB12.2W	MB 12.0	MB18.0	MB MAV-2W
Frequency Response [1]	66Hz - 18KHz	54Hz - 18,5KHz	38Hz - 18,5KHz	65Hz - 18KHz	42Hz - 90Hz	32Hz - 90Hz	50Hz - 18,5KHz
Operating Frequency Range [2]	59Hz - 19KHz	48Hz - 19,5KHz	33Hz - 19,5KHz	60Hz - 18KHz	35Hz - 100Hz	29Hz - 100Hz	47Hz - 19KHz
Maximum SPL [3]	127dB SPL	131,6dB SPL	134,6dB SPL	130,2dB SPL	127,8dB SPL	134,3dB SPL	136,9dB SPL
Coverage Angle [4]	100° (conical)	85° x 40°	65° x 40°	80° (conical)	Omni	Omni	75° x 55°
Coverage Angle Range	1,3 - 14KHz	1,1 - 13KHz.	0,7 - 13KHz	1,5 - 14KHz	35 - 90Hz	29 - 80Hz	950Hz - 13KHz
Crossover Frequency	1750Hz nominal	1350Hz nominal	650Hz nominal	850Hz nominal	100Hz nominal	100Hz nominal	860Hz nominal
Transducers LF	8-in V-Reflex Technology provides maximum LF output	12-in optimally vented cone driver	15-in V-Reflex Technology provides maximum LF output	12-in optimally vented cone driver	12-in optimally vented cone driver	18-in optimally vented cone driver	15-in optimally vented cone driver
Transducers HF	1-in exit, coaxial 1,7-in diaphragm horn loading	1-in exit driver 1,7-in diaphragm CD horn loading	2-in exit driver 3-in diaphragm CD horn loading	2-in exit driver 3-in diaphragm horn loading	- -	- -	1,4-in exit driver 3-in diaphragm CD horn loading
Balanced Input Section Sensitivity	+4dBu						
Connectors	Female XLR, Male XLR loop out						
Input Impedance	12KΩ balanced						
Amplifiers Type (convection cooled)	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier	High Efficiency Digital Amplifier
Burst capability [5]	2 x 300W	2 x 610W	3 x 610W	2 x 610W	880W	1860W	2 x 1200W
THD, DIM, SMPTE:	< 0,05%						
Protections	Over-temperature power limiting, Thermal shutdown, Short-circuit/Overload output protection, Soft Clip limiter						
DSP on board	48KHz AD/DA, 24bit. Signal routing, crossovers, system-Eq, offset delay, time-shaped limiters						
Operation Mode Switch	Full Range / High Pass (100Hz LR24)		FR / HP (80Hz LR24)	FR/HP (100Hz LR24)	80Hz / 100Hz LP (LR24)		FR / HP (90Hz LR24)
Mains Connector	PowerCon AC-input connector, link PowerCon Out						
Mains AC Power	Nominal 230VAC(195-240)[6] - 50Hz						
Current Requirement	2A	3A	4A	3A	3A	4A	4A
Dimensions (HxWxD)cm	34,5 x 26,5 x 26,5	55 x 36,5 x 40	73 x 52 x 43	41 x 51 x 28	44 x 36 x 48	85,5 x 50 x 52	43,5 x 74 x 31
Weight	11 Kg	25 Kg	45,3Kg	26 Kg	24,5Kg	45 Kg	25,3 Kg
Cabinet baltic birch multiply	12mm	18mm	18mm	18mm	18mm	18mm	18mm
Finish	Black scratch resistant waterborne coating system.						
Protection Grill	Perforated steel grill, powder coated.						
35mm pole mount	- -	On bottom panel	- -	On bottom panel	On top panel	On top panel	- -
Hanging Points	2 x M10, on top and bottom panel	5 x M10, on top, bottom and rear panel	5 x M10, on top, bottom and rear panel	- -	- -	- -	- -

Notes

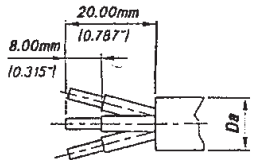
(1) Frequency Response (± 3dB) measured on-axis in half-space loading condition, 1/36 octave frequency resolution. Half space condition occurs when floor, rear or side walls are close to loudspeaker, and affect low frequencies loading.
(2) Range limits stated at - 6dB.
(3) Maximum Full Range SPL measured in half-space loading condition, referred to 1m measurement distance, with pink noise (6dB crest factor).
(4) - 6dB points.
(5) Amplifier capability with pink noise (6dB crest factor).
(6) Performance Data measured with 230VAC.

NEUTRIK CONNECTING THE WORLD

Assembly Instructions

NAC3FCA / NAC3FCB:

Cable Preparation



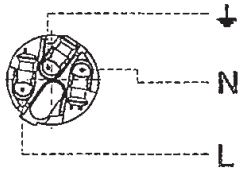
Da=5.00 (0.197")-11.00 (0.433")

white chuck

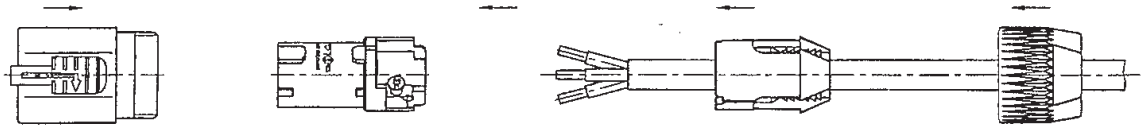
Da=9.50 (0.374")-15.00 (0.59")

black chuck

Wiring



Assembling



Housing *Insert* *Chuck* *Bushing*

1) Put bushing and chuck onto the cable.

2) Prepare cable as shown above.

3) Insert the wires into the terminals and fasten the clamping device by means of Allankey 1/16" or flat screw driver.

4) Push insert and chuck into housing (pay attention to the guiding keyway!).

5) Fasten bushing by means of a fork wrench 3/4".